Translation of the relevant parts of WO 01/26973 A2

H · E file: 137 514 / alexika

International Application Number: PCT/DE00/03512
Date of International Application: October 6, 2000
Title: Screw Cap for a Container

Screw Cap for a Container

The invention relates to a screw cap for a container which can for example have the shape of a bottle and contain tablets without the invention being restricted to the aforementioned form and intended use. The screw cap can be provided with an outer cap which forms a childproof container closure and must be depressed to unscrew the screw cap, so that a fluting at the underside of the outer cap engages with a fluting at the upper side of the lid portion of the screw cap. The invention is not restricted to this either; on the contrary, the screw cap can also be used without a childproof outer cap.

If the contents of the container have to be protected from infiltrating atmospheric moisture (as is usually the case in pharmaceutical products, for example), a moisture-absorbing desiccant is accommodated in the container. In the past, this has been carried out in containers provided with screw caps by placing a desiccant pad onto the contents of the container before using the screw cap to close the container.

This embodiment has the drawback that the process of filling the container requires an additional operation, that is to say the inserting of the desiccant pad into the container, and that the filling elements located in direct proximity to the desiccant pad can excessively dry out, so that they become very brittle; this is the case in gelatin capsules, for example.

The present invention is based on the object of further developing a screw cap of the type in question in such a way as to avoid the above-mentioned drawbacks. The invention also seeks to disclose a method for manufacturing a screw cap of this type.

According to the invention, these objects are achieved by the features of patent claims 1 and 7.

Advantageous embodiments of the invention are characterised in the dependent claims.

In the screw cap according to the invention, a desiccant chamber is moulded onto the lid portion. The desiccant chamber is thus formed in one piece with the screw cap, thus eliminating the previous requirement to introduce a body, which is formed separately from the screw cap and filled with desiccant, into the container.

In addition, the desiccant chamber attached to the lid portion makes it possible to ensure, using simple means, that the contents of the container are not excessively dried out at certain points – i.e. in proximity to the desiccant.

The method according to the invention provides for the region of the thread at the inner side of the substantially cylindrical outer wall of the screw cap to be demoulded in that an associated mould core part is rotated until the screw cap is disengaged from this mould core part after the internally adjoining mould core part has been withdrawn for demoulding the screw cap relative thereto in the axial direction. This means that a mould core consisting of two (or more) parts is provided for forming the outer wall of the desiccant chamber and the thread at the inner side of the cylindrical outer wall of the screw cap, as a result of which the problem of demoulding the screw cap provided with the moulded-on desiccant chamber is solved in accordance with the invention.

Furthermore, it is particularly advantageously proposed that a cover cap with a bottom wall provided with holes be fastened to the lower end of the desiccant chamber and that a partition, which delimits the space for receiving the desiccant, be arranged at a distance over this bottom wall. The bottom wall of the cover cap thus serves to set the filling material apart from the desiccant, thus ruling out the risk of excessive drying-out of the upper components of the contents of the container. The partition delimiting the space for receiving the desiccant is expediently made of cardboard.

In further details, it is proposed that ribs, which run in the axial direction and end at a distance of a few millimetres above the lower edge of the desiccant chamber, be arranged on the inner wall of the desiccant chamber, distributed over the circumference. The cardboard disc, which is fixed in this position by the cover cap which is inserted into the

lower end portion of the desiccant chamber, rests on the free lower end faces of these longitudinal ribs. This advantageous embodiment is simple to produce and can be assembled at low cost.

In addition, the invention proposes that an annular attachment, which has in cross section a convex outer contour, is conventionally referred to as an olive ring and rests tight against the inner wall of the container neck when the screw cap is screwed on, be moulded onto the lid portion of the screw cap radially outside the desiccant chamber.

In addition, provision may be made for it to be possible to snap onto the screw cap according to the invention a childproof outer cap which can be used to rotate the screw cap in the opening direction when the outer cap, the lid portion of which has a convex shape with respect to the screw cap, is depressed in such a way that a fluting at the underside enters into engagement with a fluting at the upper side of the lid portion of the screw cap.

Further details of the invention will emerge from the following description of a preferred embodiment of the screw cap according to the invention and of a tool for manufacturing this screw cap given with reference to the drawings, in which:

Fig. 1 is a vertical section through the screw cap;

Fig. 2 is a plan view onto the screw cap according to Fig. 1;

Fig. 3 is a vertical section through a container with a screwed-on screw cap onto which a childproof outer cap is snapped;

Fig. 4 is a side view of the arrangement according to Fig. 3; and

Fig. 5 shows basic parts of a tool for manufacturing the screw cap.

Reference will firstly be made to Figures 1 and 2 which show a screw cap 1 in an enlarged state. The screw cap contains a lid portion 2 which in the edge region merges with a substantially cylindrical outer wall 3. A thread 4 is formed on the inside of this outer wall 3.

A desiccant chamber 5, from the inner wall of which protrude webs 6 which run in the axial direction and end at a distance d of a few millimetres above the lower edge 7 of the desiccant chamber 5, is moulded onto the underside of the lid portion 2. The lower end faces 8 of the webs 6 form rests for a cardboard disc 9 (Fig. 3), as will be described in greater detail hereinafter.

In addition, an olive ring 10 is moulded onto the underside of the desiccant portion 2 radially outside the desiccant chamber 5.

In the lower region of the outer wall 3, said outer wall widens to an annularly protruding locking lug 11 onto which an outer cap 12 (Fig. 3 and 4) with an inner annular projection 13 snaps.

An annular toothed rim, the teeth 14 of which each have an oblique flank 15 and – opposing said flank – a vertical end face 16, is moulded onto the upper side of the lid portion 2. A correspondingly shaped toothing 17 at the underside of the lid portion 18 of the outer cap 12 can engage with these teeth 14 when said outer cap is depressed into a substantially planar state; this will be described hereinafter with reference to Fig. 3.

The lid portion 18 of the outer cap 12 has a convex shape with respect to the internal screw cap 1, the lid portion 18 resting with the centre 19, which protrudes in an arched manner, on the screw cap 1, while the toothing is engaged with the teeth 14 of the screw cap 1.

As mentioned hereinbefore, once the desiccant chamber 5 has been filled, a cardboard disc 9 is inserted into the lower end portion of said desiccant chamber in such a way that the cardboard disc 9 rests on the end faces 8 of the webs 6. A cover cap 26 is then inserted with a clamping fit into the lower end portion of the desiccant chamber 5 which holds the cardboard disc 9 in position. The cover cap 26, which is made of plastics material, has a perforated bottom wall 27 and serves to set the contents of the container apart from the desiccant.

The container 20 is made from plastics material by injection blow moulding or extrusion blow moulding and contains in the neck region an inwardly pointed thickening 21 which is set just slightly apart from the desiccant chamber 5. In this case, the neck region widens, the olive ring 10 resting against the upper edge region of the container neck. The toothed rim 14 opposes the upper edge of the container neck.

Fig. 5 shows a basic part of an injection moulding tool for manufacturing the screw cap 1 according to the invention. The region between the thread 4 and the desiccant chamber 5 is formed by a mould core divided in two: an outer mould core part 21 and a radially internal mould core part 22 which also delimit the mould cavity for the olive ring 10. A sleeve 23, which is positioned securely in the tool and against the inner side of which rests a further mould core part 24 which, like the mould core parts 22, 21 and a tool part 25 resting externally thereagainst, is displaceable in the axial direction, adjoins radially on the inside.

For demoulding the screw cap 1, the tool parts 24, 22, 21 and 25 firstly travel in the illustration of Fig. 5 toward the right, while the sleeve 23 (which is positioned securely in the tool) remains stationary, as a result of which the desiccant chamber 5 is exposed at the inner side.

There follows a second stroke of the components 25, 21 and 24 toward the right, the mould core part 22 remaining stationary, so that the olive ring 10 is internally exposed.

In a third step, the mould core part or the insert 21 is rotated about its longitudinal axis, the screw 1 being unscrewed from the engagement with the mould core part 21, the tool parts 25 and 24 following this movement to the right. The threaded portion of the screw cap is thus exposed.

There follows a final stroke of the components 25 and 24 toward the right until the screw cap 1 is ejected from the tool.

Patent claims

1. Screw cap made from plastics material by injection moulding process, with a lid portion and a substantially cylindrical outer wall, formed on the inner side of which is a thread, characterised in that a desiccant chamber (5) is moulded onto the lid portion (2).

2. Screw cap according to claim 1, characterised in that a cover cap (26) with a bottom wall (27) provided with openings is fastened to the lower end of the desiccant chamber (5) and in that a partition (9), which delimits the space for receiving the desiccant, is arranged at a distance over the bottom wall.

3. Screw cap according to claim 1 or 2, characterised in that the partition (9) is a disc made of cardboard.

4. Screw cap according to one of claims 1 to 3, characterised in that longitudinal ribs (6) are moulded onto the inner wall of the desiccant chamber (5) so as to be distributed over the circumference of the desiccant chamber (5) which ends at a short distance (d) above the edge (7) of the desiccant chamber (5).

5. Screw cap according to one of claims 1 to 4, characterised in that the cover cap (26) is inserted into the lower end of the desiccant chamber (5), the cardboard disc (9) resting on the free end faces (8) of the longitudinal ribs (6).

6. Screw cap according to one of claims 1 to 5, characterised in that a childproof outer cap (12) is snapped onto the screw cap (1).

7. Method for manufacturing a screw cap according to one of claims 1 to 6, characterised in that the region between the thread and the desiccant chamber of the screw cap is formed by a mould core divided in two.

8. Method according to claim 7, characterised in that the region of the thread of the screw cap is demoulded in that an associated mould core part (21) is rotated about its longitudinal axis after a radially inwardly adjoining mould core part (22) has been withdrawn in the axial direction.

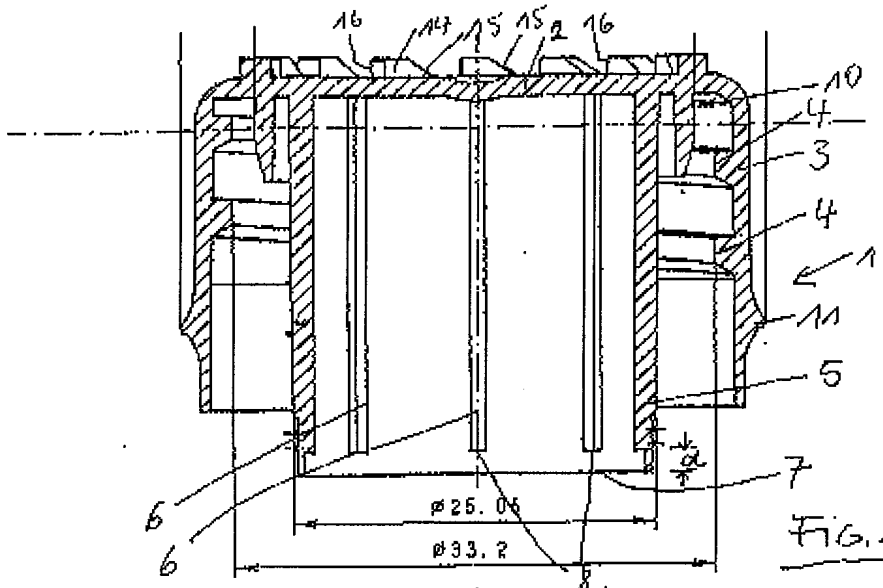


FIG.1

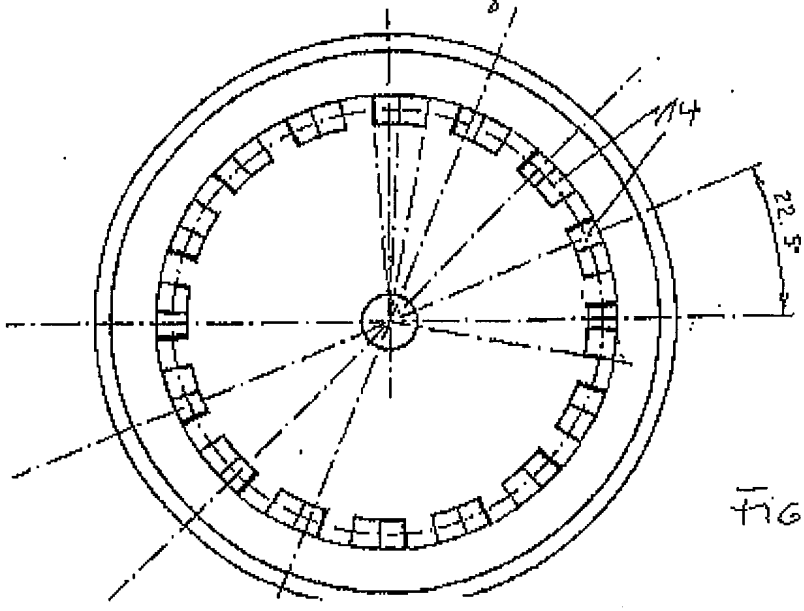


FIG.2

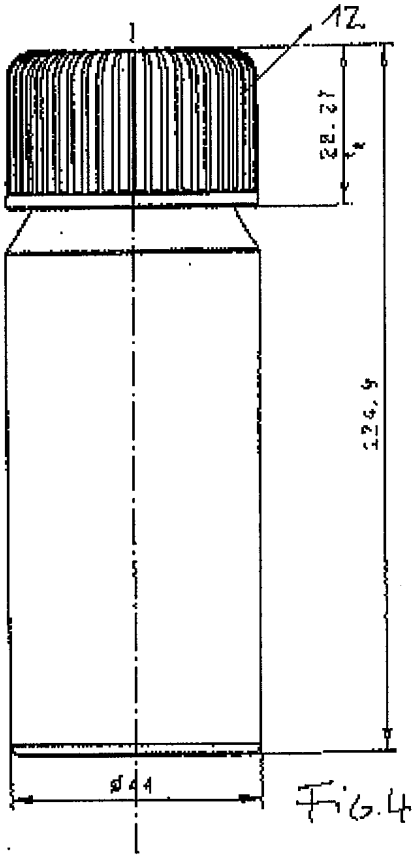


Fig.4

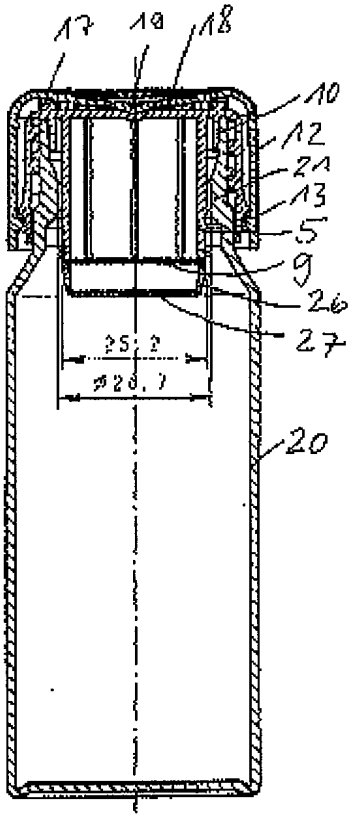
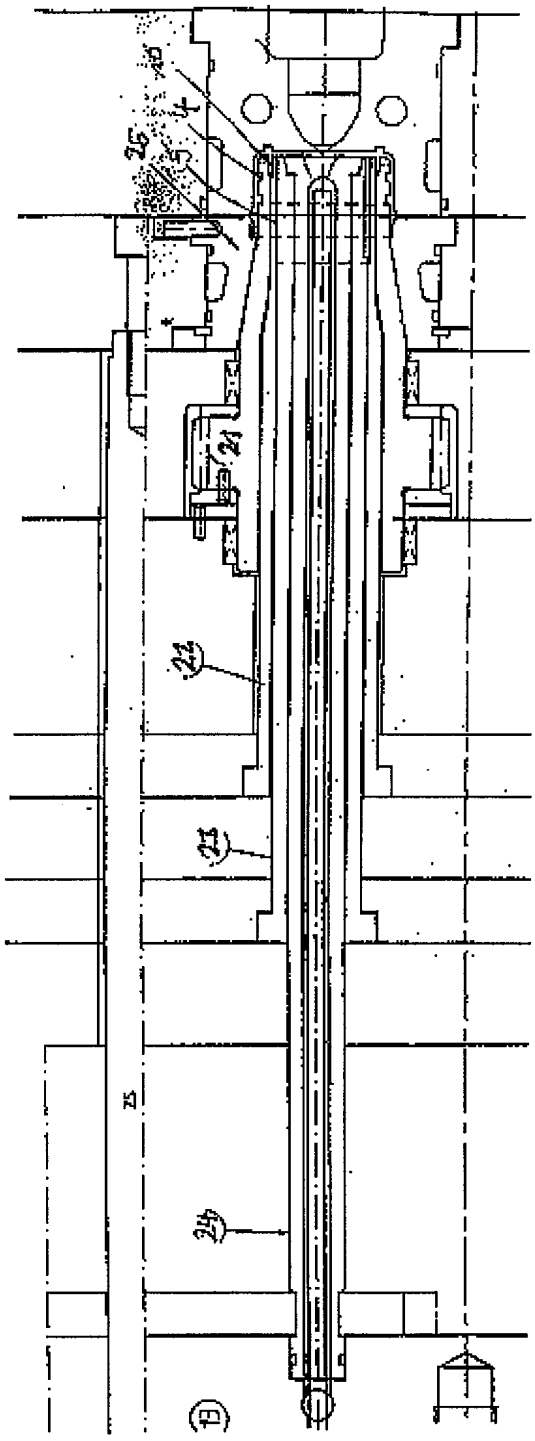


Fig.3



Figur 5